CHAPTER 12 – DESIGN

1.0 General Information

1.1 The policies and procedures contained in this section are appropriate for most capital improvement projects designed by a project architect/engineer. It is recognized not all the policies and procedures set forth in the section are necessary for all projects. However, it is the project architect's/engineer's responsibility to comply with all necessary policies and procedures, consistent with the scope of the project as directed by the project team.

1.2 The following chronological outline is for the project architect/engineer to follow during the design phase of any capital improvement project. Not every item will apply to every capital improvement project and should be verified between the agency on restricted projects, and by the negotiating committee.

- ☐ Review project program to verify construction estimate in program and notify the project team when the construction estimate exceeds the program requirements.
- ☐ Identify all proposed consultants, additional consultants and/or changed consultants for the state agency's and negotiating committee's approval.
- ☐ Attend all project meetings (including the kickoff meeting) when scheduled by the project team.
- ☐ Ascertain pertinent information to aid owner/state agency and DFM planner in contracting for ancillary services such as the site survey, utility information and geotechnical investigation through DFM.
- ☐ Prior to the first review, establish schedule for the completion of preliminary design, construction documents and construction that is acceptable to the project team. Dates for all significant reviews should be included.
- ☐ Review and analyze all code requirements, standards and laws listed in the project architect's/engineer's contract which are applicable to the project. Develop a code footprint and provide for review and acceptance per chapter 7.
- ☐ During the design and prior to the preparation of contract documents, the project team, will determine if plans and specifications will be prepared and a single construction contract let for the project as a whole or **multiple construction contracts** independently let for the demolition, hazardous abatement, electrical, mechanical, plumbing and all other work portions of the project.
- ☐ Develop concepts and preliminary cost estimate for review, distribute documents and notify the agency to coordinate and schedule a review meeting with the project team.
- ☐ Prepare schematics for review, distribute documents and notify the agency to coordinate and schedule a review meeting with the project team.
- ☐ After approval of schematics, confirm the target date for design development submittal.
- ☐ Prepare design development documents (including the code footprint per Chapter 7) for review, distribute documents and notify the agency to coordinate and schedule a review meeting with the project team.

□ When a rendering is negotiated as part of the services, the project architect/engineer will comply with the requirements at the end of this chapter.

2.0 Concept Design

2.1 The project architect/engineer shall involve all necessary consultants and develop at least three alternative solutions to the design of the capital improvement project. The alternative solutions shall (when applicable) be within the structure of the agency's program and shall address but not be limited to:

2.1.1 Approach to code compliance for life safety issues, per Chapter 7.

2.1.2 Accessibility compliance, per Chapter 7.

2.1.3 Site limitations, including utilities.

2.1.4 Building location on site.

2.1.5 Vehicular and pedestrian circulation.

2.1.6 Number of floors.

2.1.7 Arrangement of programmed spaces

2.1.8 Itemized inventory of programmed space, indicating surplus or deficiency.

2.1.9 Engineering systems.

2.2 Concept design submittal shall include the items listed below and shall follow the submittal and review procedures.

2.2.1 Compliance with applicable codes, standards and laws, per Chapter 7.

2.2.2 Site plans, which may be sketched.

2.2.3 Floor plans, which may be sketched but must include all programmed spaces.

2.2.4 Elevations, which may be sketched and need not show all sides of the building.

2.2.5 Written description of mechanical and HVAC systems, principal components and special functional requirements. Include concepts and studies of systems.

2.2.6 Cost estimate of each alternative approach.

2.2.7 Special considerations.

3.0 Schematic Design

3.1 The schematic design submittal shall include the items listed below and shall follow the submittal and review procedures.

3.1.1 Code footprint per Chapter 7 and compliance with all other applicable codes, standards and laws, including accessibility.

3.1.2 Site plan showing the location of the building on the site, illustrating the practical use of the natural topography and indicating existing utility locations if available, service routes, drives, parking, pedestrian trafficways and expansion possibilities if required by the program.

3.1.3 Floor plans showing room arrangement, designation, size and changes in floor elevation.

3.1.4 Elevation sketches of the exterior indicating the general architectural character of the building.

3.1.5 Single-line drawing showing mechanical equipment location.

3.1.6 Compliance with applicable federal regulations due to a federal agency's involvement in the project.

3.1.7 Written statement giving the total gross area of the building and estimate of construction costs.

3.1.8 Special considerations

4.0 Design Development

4.1 The design development submittal shall include the items listed below and shall follow the submittal and review procedures. This submittal should demonstrate a complete understanding of the design requirements to the Owner and should identify items of particular interest to the Owner. Upon the approval of the design development submittal, a design freeze will occur. No significant changes will be made to the approved plans, unless approved by the negotiating committee.

4.1.1 Compliance with applicable codes, standards and laws, including accessibility, as outlined in Chapter 7.

4.1.2 Site plan showing the location of the building on the site, illustrating the practical use of the natural topography, expansion possibilities if required by the program, utility locations and possible connections, and vehicle and pedestrian circulation including but not limited to streets, service drives, parking and sidewalks.

4.1.3 Knowledge and indication of problems of rock excavation or controlled backfill.

4.1.4 Floor plans showing room arrangement, overall dimensions of the building(s) and spaces room arrangement, door swings, casework, special equipment and features, furniture arrangement, designation, size and fixed equipment layout.

4.1.5 Elevations showing all exterior wall surfaces.

4.1.6 Building sections including longitudinal and transverse sections showing major structural components.

4.1.7 Wall sections showing typical and special wall construction.

4.1.8 Special interior wall sections

4.1.9 Preliminary finish schedule.

4.1.10 Structural concept showing the location, type and tentative size of structural members.

4.1.11 HVAC concept, using a single-line drawing, showing locations of major equipment and preliminary mechanical room layouts, verify that the largest approved equipment/systems will be accommodated in the space provided. Verify that adequate/required working and maintenance space is provided for equipment. Also included shall be a written description of the recommended system, including principle components and special functional requirements of the facility. Conflicts should be resolved with structure/ducts/piping/conduit. Fuel conservation shall be considered in the design and selection of systems and equipment. Engineer should describe the thermostat control system.

4.1.12 Plumbing concept showing pipe chases and roof drainage system. Plumbing designs for laboratories or other special facilities, materials, and designs requiring pumping shall also be included.

4.1.13 Electrical concept showing the power source, service to the building, panel locations, types of fixtures, and the foot candle levels. Also included shall be primary and secondary voltages to be used and design criteria for unusual or special electrical requirements.

4.1.14 Specifications outline shall include a brief yet concise description of all building systems including methods, materials and finishes. All building components shall be outlined in sufficient detail to afford judgment discussions concerning quality and performance. Include material cut sheets as required to convey a complete understanding of the materials used.

4.1.15 Compliance with applicable federal regulations due to a federal agency's involvement in the project.

4.1.16 Updated written statement giving the total gross area of the building and a tentative estimate of construction costs including extension of utilities and initial operating and maintenance costs of chosen mechanical system.

4.1.17 Energy impact statement, as described below.

5.0 Energy Impact Statement

5.1 An energy impact statement will be included in the design development submittal. When the project is new construction, the statement will include all calculations and verification of compliance with the latest editions of International Energy Conservation Code, including all supplements.

5.2 When the project is a renovation, retrofit or repair, the statement will analyze only the systems or components being changed and will include all calculations and verifications of compliance with the latest editions of International Energy Conservation Code.

6.0 Rendering

6.1 If a rendering has been included in the firm’s contract, the project team will determine when the rendering should be completed and the firm shall provide the following:

6.1.1 A sketch of the proposed perspective for approval from the project team prior to beginning the rendering.

6.1.2 Two renderings, one original and one full size, color copy, a minimum of 400 square inches without the matting.

6.1.3 The building name, agency/institution for which the project is being designed, and the name of the project architect/engineer's firm.

6.1.4 Both renderings shall both be framed with a metal frame, at least a 2" matt on all four sides, and have a wire on the back for hanging.

6.1.5 Two color photocopies of the original rendering reduced to half size.

END OF CHAPTER 12